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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/008,531 01/16/98 RHODES

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EXAMINER

MM91/0130

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ART UNIT

PAPER NUMBER

2823

DATE MAILED:

01/30/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/008,531

Applicant(s)

RHODES, HOWARD E.

Examiner

Kurt M. Eaton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2000.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 31-34, and 40-42 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsuo, as previously applied in the office action mailed 10/24/00.

Furthermore, in re claim 31, Matsuo shows providing a substrate having at least one semiconductor layer (1); forming the conductive layer over the at least one semiconductor layer; forming an overlayer (23) over the conductive layer; and forming the contact in the overlayer.

Furthermore, in re claim 40, Matsuo shows providing a substrate having at least one semiconductor layer (1); forming the conductive layer over the at least one semiconductor layer; forming an overlayer (23) over the conductive layer; and forming the contact through the overlayer.

4. Claims 26-28, 30, 35, 36, 44, and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Bergemont, as previously applied in the office action mailed 10/24/00.

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Furthermore, in re claim 26, Bergemont shows wherein the contact hole formed in the overlayer is formed by an etching process {column 9, lines 54-67}.

Bergemont fails to explicitly show wherein the etching treatment used in etching the contact hole in the overlayer etches an amount of the layer of the first conductive material.

It is inherent to one of ordinary skill in the art that no etchant used to etch the overlayer material of Bergemont selectively with respect to the first conductive material of Bergemont is capable of being completely selective. Even if the etch selectivity of one material to another is 1,000,000 : 1, the material that etches at a slower rate will still be etched an amount.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo.

In re claim 21, Matsuo shows in Figures 2A-2E and related text, a process for making a semiconductor device including the steps of providing a substrate having at least one semiconductor layer (1); forming an underlayer (21) over the at least one semiconductor layer; forming a layer of conductive material (22) over the underlayer having a topography that includes a substantially vertical component; forming an overlayer (23) over the layer of the conductive material; forming a contact hole in the overlayer; and forming a contact (13) in the contact hole disposed adjacent to

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and contacting the vertical component. Matsuo also shows wherein contact holes may be formed using an etching technique {see Figure 2B; column 5, lines 30-46}.

Matsuo fails to show wherein the contact hole formed in the overlayer is formed by etching.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the contact hole in the overlayer of Matsuo using an etching technique since Matsuo discloses that contact holes are formed by a well known technique including an etching process and the selection of a known contact hole formation process on the basis of its suitability for the intended use involves only routine skill in the art. Furthermore, the specification contains no disclosure of either the critical nature of the claimed etching process used to form the contact hole or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen contact hole formation process or upon another variable recited in a claim, the applicant must show that the particular contact hole formation processes are critical.

In re claim 22, Matsuo shows wherein the vertical component defines a localized thick region in the layer of conductive material {see Figure 2B}.

In re claim 23, Matsuo shows wherein the vertical component is a spacer {see Figure 2B}.

In re claim 24, Matsuo further includes the step of forming a structure (21) having an opening therein under the conductive layer and filling the opening with the conductive material to form the vertical component {see Figure 2B}.

In re claim 25, Matsuo shows wherein the contact disposed adjacent to and contacting the vertical component is a capacitor electrode made of the same material as the layer of conductive material {column 4, lines 3-22}.

Matsuo fails to show wherein the layer of conductive material is a capacitor electrode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the layer of conductive material and the contact, which is a capacitor electrode, of Matsuo were in electrical contact with each other. Accordingly, it would have been obvious that the layer of conductive material of Matsuo could have been considered a part of the capacitor electrode since, as far as the function of a capacitor is concerned, there exists no electrical boundary between the layer of conductive material and the contact, which is a capacitor electrode.

7. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo in view of Wolf, as previously applied in the office action mailed 10/24/00.

8. Claims 29 and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergemont in view of Chiang, as previously applied in the office action mailed 10/24/00.

9. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bergemont in view of Akimoto, as previously applied in the office action mailed 10/24/00.

Response to Arguments

10. Applicant's arguments filed 11/27/00 have been fully considered but they are not persuasive.

Response to Arguments Concerning Rejections under 35 USC §102(e)

Applicants' arguments with respect to claims 21-25 have been considered but are moot in view of the new ground(s) of rejection.

Applicant contends that Matsuo does not show forming an overlayer or forming a contact through the overlayer. The examiner respectfully disagrees and directs applicants attention to reference numerals (13) and (23) in Figure 2B of Matsuo.

Applicant contends that Bergemont does not disclose all of the claimed limitations found in claim 26. More specifically, Applicant contends Bergemont does not teach forming a localized thick region or etching the contact hole in the overlayer and an amount of the layer of the first conductive material. The examiner respectfully submits the following: (a) Bergemont does teach forming a localized thick region (notice the area of the first conductive material located above the source diffusion area); and (b) it is inherent to one of ordinary skill in the art that no etchant used to etch the overlayer material of Bergemont selectively with respect to the first conductive material of Bergemont is capable of being completely selective. Even if the etch selectivity of one material to another is 1,000,000 : 1, the material that etches at a slower rate will still be etched an amount.

Applicant contends that Bergemont does not disclose all of the claimed limitations found in claim 35. More specifically, Applicant contends Bergemont does not teach forming a first layer of material and forming an opening therein because Bergemont only discloses "forming a number of layers and forming spacers". The examiner respectfully submits that Bergemont shows in Figures 10-12 forming a first layer of material (118) and forming an opening therein. It is asserted by Applicant that a layer is formed with an opening to allow for the localized thick region to be formed, however, it is noted that the features upon which applicant relies (i.e., a layer being formed with an opening to allow for the localized thick region to be formed) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In the instant case, all that is claimed in claim 35, pertaining to the formation of the localized thick region, is that a layer of first conductive material is formed "on said first layer of material and along the surfaces of the sidewalls of the opening to form a localized thick region".

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Applicant contends that Bergemont does not disclose all of the claimed limitations found in claim 44. More specifically, Applicant contends that Bergemont fails to disclose forming a thick region or a thick component because Bergemont only forms a conductive layer having a substantially uniform thickness. The examiner respectfully submits that, in forming a conductive layer having a substantially uniform thickness, a thick region/component is also formed. See Figure 13 of Bergemont. Applicant contends that claim 45 depends from claim 44 and should therefore be allowable over the prior art of record however, claim 45 is independent from claim 44.

Response to Arguments Concerning Rejections under 35 USC §103

Applicant contends that the subject matter of claim 43 is patentable over the combination of Matsuo in view of Wolf because the “tolerable amount in claim 43 is much higher than the tolerable amount used in Wolf due to the thick region”. The examiner respectfully submits that it is noted that the features upon which applicant relies (i.e., an actual positively defined amount which is a “tolerable amount”) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant contends that Bergemont does not disclose all of the claimed limitations found in claim 37. More specifically, Applicant contends that Bergemont does not teach “providing a first layer and forming an opening therein”. The examiner respectfully submits that Bergemont shows in Figures 10-12 forming a first layer of material (118) and forming an opening therein. Applicant contends that Bergemont fails to disclose forming a thick region because Bergemont only forms a conductive layer having a substantially uniform thickness. The examiner respectfully submits that, in forming a conductive layer having a substantially uniform thickness, a thick region is also formed. See Figure 13 of Bergemont. Applicant states that what is important about Applicants claimed

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process is that "the contact hole can be made to a larger size than convention contact holes due to the thick region" and that "an aspect of the present invention is that the process permits relaxing tolerances of various components such as the contact and contact hole". However, these arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

The examiner notes that Applicants may expressly reserve the right to swear behind Akimoto which has an issue date of 9/16/97 and a filing date of 12/27/94. However, the reservation to swear behind a reference does not replace the need for an affidavit under 37 CFR §1.131 in order to determine whether, in fact, subject matter commensurate within the scope of the claims was completed prior to the critical date of the reference.

Conclusion


11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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12. Paper related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication of earlier communication from the examiner should be directed to **Kurt Eaton** at **(703) 305-0383** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via kurt.eaton@uspto.gov.


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